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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/970,080	10/03/2001	Henry Sowizral	5181-68801 P5161	8117

7590 . 01/14/2005

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EXAMINER
ALAUBAIDI, HAYTHIM J

ART UNIT	PAPER NUMBER
2161	

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Applicati n No.
09/970,080</td><td>Applicant(s)
SOWIZRAL ET AL.</td></tr>
<tr><td>Examin r
Haythim J. Alaubaidi</td><td>Art Unit
2161</td></tr>
</table>

-- *The MAILING DATE of this c mmunication appears on the c ver sheet with the correspondence address* --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 June 2004</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 33-43* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11,12 and 33-43* is/are rejected.

7)☒ Claim(s) *2-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
   application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 1-04)   Office Action Summary   Part of Paper No./Mail Date 20050107

DETAILED ACTION

1.   This communication is a Final Office Action in response to the Amendment filed

on June 30, 2004.

2.   Claims 1-12 and 33-43 are presented in the Application following the amendment

of June 30, 2004.

3.   The Examiner acknowledges the new added claims No. 42 and 43.

4.   The Examiner acknowledges the cancellation of Claims 13-32 by the Applicant.

5.   Claims 1, 11-12 and 33-43 are rejected under 35 U.S.C. 103(a).

6.   Claims 2-10 are objected to as being dependent upon a rejected base claim.

Response to Arguments

7.   Applicant's arguments filed in the Amendment of June 30, 2004 have been fully

considered but they are not persuasive.

The Applicant argues that Matsui does not teach replacing portions of the scene

graph with pointers. The Examiner however disagrees. Matsui discloses replacing

portions of the scene graph with pointers (Col 12, Lines 6-10; see also Figure 8 and

corresponding text; see also Col 21,Lines 39-51 and other locations through the

reference, especially in regard to wait memory 59; see also Col 22, Lines 27-36).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 1, 11, 33-39 and 41 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Daniel J. Woods (U.S. Patent No. 5,956,039 and Woods hereinafter)

in view of Kazuki Matsui (U.S. Patent No. 6,437,778 and Matsui hereinafter).

Regarding Claims 1, 33 and 39, Woods discloses:

determining the current location for a viewpoint (Figure 6, Element 606 and

corresponding text)

determining a current locality threshold (Figure 6, Element 602 and 604 and

corresponding test)

determining which portion of the scene graph are relevant to the current locality

threshold (Woods, Abstract; see also Col 3, Lines 58-65)

loading into a local memory those portions of the scene graph that are relevant

within the current locality threshold (Col 3, Lines 58-65; see also Col 3, Line 66 through

Col 4, Line 8; see also Col 6, Lines 35-36, i.e. The Anchor group node loads a new

scene into a VRML browser when one of its children is selected by the user; see also

Col 6, Lines 41-42)

wherein the pointers indicate where the replaced portions may be loaded from if the replaced portions are needed (Col 6, Lines 16-23; see also Lines 26-35 and Line 36[1])

Woods reference discloses all of the claimed subject matter set forth above including replacing a scene with another one as needed (Col 6, Lines 41-42), except the reference does not explicitly indicate the steps of replacing portions of the scene graph that are not relevant within the current locality threshold with one or more pointers.

However Matsui teaches replacing portions of the scene graph that are not relevant within the current locality threshold with one or more pointers (Col 12, Lines 6-10; see also Figure 8 and corresponding text; see also Col 21,Lines 39-51 and other locations through the reference, especially in regard to wait memory 59; see also Col 22, Lines 27-36).

Given the intended broad application of the Woods system, it would have been obvious to a person of ordinary skill in the art at the time of Applicant's invention to modify the teachings of Woods with the teachings of Matsui to replace portions of the scene graph that are not relevant within the current locality threshold with one or more pointers, one reason would be to save memory space and to increase system performance especially when dealing with large amount of data such as in large Virtual Reality programs.

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[1] As the system is able to tell which parent scene to load and from where if the user selected a child scene (Col 6, Lines 35-36) this is according to the references to other scenes mentioned in Col 6, Lines 19-20.

Regarding Claims 11 and 41, Matsui discloses wherein said replacing is performed only once a predetermined level of memory utilization is reached (Col 22, 24-28).

Regarding Claims 34 and 36, Woods discloses determining a current acceleration (Woods, Col 6, Lines 31-33, i.e. However as the observer moves closer to the object); and using the acceleration value to determine the predicted future viewpoint (Woods, Col 6, Lines 32-35; see also Matsui, Col 6, Lines 30-39).

Regarding Claim 35, Woods discloses rendering one or more frames based on the scene graph (Col 2, Lines 37-40).

Regarding Claim 37, Woods discloses application programming interface (Col 6, Lines 25-27; see also Figures 1 and 3).

Regarding Claim 38, Woods discloses graphics application (Col 5, Lines 15-20).

Regarding Claim 42, Woods discloses determining which of the objects in the scene graph are visible from the current location (Abstract, i.e. Asset type origins are defined and moved, based on the position, orientation, and velocity of the camera. Regions are assigned priorities based on their distance from the asset origin. Assets within particular regions are assigned priorities based on the region priorities and the asset type; see also Figure No. 6, Element No. 606; see also Col 7, Lines 56-65; see also Col 11, Lines 18-28.

Regarding Claim 43, Woods discloses objects in the scene graph that are not visible from the current viewpoint (Col 6, Line 57 through Col 7, Line 2; see also Col 7, Lines 37-47).

10.   Claim 12, is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniel

J. Woods (U.S. Patent No. 5,956,039 and Woods hereinafter) in view of Kazuki Matsui

(U.S. Patent No. 6,437,778 and Matsui hereinafter) and further in view of Lawrence P.

Reed (U.S. Patent No. 5,577,180 and Reed hereinafter).

        Regarding Claim 12, the combination of both Woods and Matsui references

disclosed all of the claimed subject matter set forth above, except both references did

not explicitly indicate the feature of employing hysteresis to prevent thrashing.

However, since this is a well known method used in memory management, the

Examiner is using another reference for Reed to teach this feature. Reed teaches

employing hysteresis to prevent thrashing (Col 4, Lines 36-43).

        It would have been obvious to a person of ordinary skill in the art at the time of

Applicant's invention to modify the teachings of both Woods and Matsui with the

teachings of Reed to employ hysteresis in order to prevent thrashing, as it is well known

in managing memory in order to minimize system usage of the processor and to

increase the computer performance, in other words, to prevent the CPU processor from

spending most of its time moving data between different levels of storage and little of it's

time performing useful work (see the documentation attached for "Memory

Management").

11.   Claim 40, is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniel

J. Woods (U.S. Patent No. 5,956,039 and Woods hereinafter) in view of Kazuki Matsui

(U.S. Patent No. 6,437,778 and Matsui hereinafter) and further in view of Kenneth E.

Hoff III, ACM Crossroads Student Magazine, "Faster 3D game graphics by not drawing

what is not seen").

Regarding Claim 40, the combination of both Woods and Matsui references

disclosed all of the claimed subject matter set forth above, except both references did

not explicitly indicate the feature of wherein the current locality threshold equals a

current view frustum. However Hoff III, teaches wherein the current locality threshold

equals a current view frustum (Hoff III, Abstract; see also Pages, 3-4).

It would have been obvious to a person of ordinary skill in the art at the time of

Applicant's invention to modify the teachings of both Woods and Matsui with the

teachings of Hoff III, to make current locality threshold equals a current view frustum, in

order to not waist any memory with scenes that are not visible to the user and to

dramatically reduce the load on the graphics subsystems (Hoff III, Abstract).

Allowable Subject Matter

12.   Claims 2-10 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

13.   The following is the Examiner's statement of reasons for the indication of

allowable subject matter:

Regarding Claim 2, Applicant's particular system and associated methods in the

environment of managing graphical scenes is loading into the local memory those

portions of the scene graph that are relevant within the predicted future locality

threshold, in combination with the limitation of wherein said replacing is performed only

on portions of the scene graph that are not relevant within (i) the current locality

threshold and (ii) the predicted future locality threshold record in combination with the

other limitations of the claims, was not disclosed by, would not have been obvious over,

nor would have been fairly suggested by the prior art of record or that encountered in

searching of the prior art.

The dependent Claims 3-10 being further limiting to dependent Claim 2 definite

and enabled by the Specification would also be allowed if its respective dependent

Claim 2, was rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

14.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action

Points of Contact

15.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Haythim J. Alaubaidi whose telephone number is (571)

272-4014. The examiner can normally be reached on Monday - Friday from 8:00 AM to

4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Safet Metjahic, can be reached on (571) 272-4023.

Any response to this office action should be mailed to:

The Commissioner of Patents and Trademarks, Washington, D.C. 20231 or telefax at

our fax number (703) 872-9306.

Hand-delivered response should be brought to Crystal Park II, 2121 Crystal Drive, 6th

Floor Receptionist, Arlington, Virginia. 22202.

Haythim J. Alaubaidi

_____

Patent Examiner
Technology Center 2100
Art Unite 2161
January 9, 2005

SAFET METJAHIC
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100